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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

|                              |                 |                   |  |
|------------------------------|-----------------|-------------------|--|
| <b>Office Action Summary</b> | Application No. | Applicant(s)      |  |
|                              | 10/723,736      | AVINASH, GOPAL B. |  |
|                              | Examiner        | Art Unit          |  |
|                              | Amara Abdi      | 2624              |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 19 September 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-26 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

### **DETAILED ACTION**

1. Applicant's response to the last office action, filed September 19, 2007 has been entered and made of record.
2. In view of the Applicant amendments, the objections to drawings are expressly withdrawn.
3. In view of the Applicant amendments, the objection to the claim 9 is expressly withdrawn.
4. In view of the Applicant Arguments, the rejection of claim 19 under 35 U.S.C 101 is expressly withdrawn.
5. Applicant's arguments with respect to claims 1-26 have been considered but are moot in view of the new ground(s) of rejection.

### **Claim Rejections - 35 USC § 101**

6. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

7. The claimed invention is directed to non-statutory subject matter. Claims 24-26 are rejected. "One or tangible media encoding a computer program" must be "computer readable medium encoded with a computer program" in order to be statutory subject matter. The tangible medium may be medium other than a computer readable medium;

therefore it is not statutory subject matter. The applicant is urged to amend the claims 24-26 to become a statutory subject matter.

**Claim Rejections - 35 USC § 103**

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 1, 6, 21, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fritz et al. (US-PGPUB 2003/0199762) in view of Tannenbaum et al. (US 6,535,623) and Wilensky et al. (US 7,171,057).

**(1) Regarding claims 1, 21, and 24:**

Fritz et al. disclose a method, apparatus (paragraph [0003], line 1-2) and computer program (paragraph 0037], line 1-2) for accurately determining the intima-media thickness of a blood vessel, where characterizing the spike noise in the input image data (paragraph [0072], line 3-4), (the characterizing the spike noise in the input image data is read as reducing a spike noise in an image). Fritz et al. do not explicitly mention the following items:

1) the processing of the input image data by identifying features of interest to produce processed image data;

2) performing a spike noise dependent blending of data derived from the input image data with the processed image data based upon the characterization.

**(A) Concerning item 1):**

Tannenbaum et al., in analogous environment, teaches a curvature based system for the segmentation and analysis of cardiac magnetic resonance images, where processing the input image data by identifying features of interest to produce processed image data (column 5, line 41-44).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the system of Tannenbaum et al., where processing the input image data by identifying features of interest, in the system of Fritz et al. in order to performing segmentation on discrete pixel images, such techniques would be particularly useful in analyzing moving tissues, such as those of the heart (column 2, line 48-55).

**(B) Concerning item 2):**

Wilensky et al., in analogous environment, teaches an image blending using non-affine interpolation, where the first and second image components are blended together to produce a blended component (Fig. 1, step 110, column 4, line 63-66), (the blending of the image first and second image components is read as the same concept as the blending of the data derived from the input image data with the processed image data) based upon characterization (column 4, line 35-37), (the characterization of spike noise is read as the same concept as the reducing of noise).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the system of Wilensky et al., where blending the first and second image components, in the system of Fritz et al. because such feature result in a

faster transition in the high-frequency components and thereby reduce the size of any region affected by noise cancellation while still allowing a gradual overall transition (column 1, line 64-67).

**(2) Regarding claim 6:**

Fritz et al. disclose all the subject matter as described in claim 1 above.

Fritz et al. do not explicitly mention the method, where the weighting factor is performed on discrete picture elements determined not to exhibit spike noise, and blending via a least a second weighting factor is performed on discrete picture elements determined to exhibit spike noise.

Wilensky et al., in analogous environment, teaches an image blending using non-affine interpolation, where using the formulas (5):  $\text{blend} = (1-\beta) I1s + \beta I2s$  (column 7, line 49), with a first weighting factor  $\beta$  varying between (0) to (1) (column 8, line 5), and ( $I1s$  and  $I2s$  means a non-noise components) on discrete picture elements (paragraph [0001], line 2) (the discrete picture element is read as a pixel) determined not to exhibit spike noise (the exhibit is read as display or show), ( if  $\beta = 1$ ,  $\text{Blend} = I1s + I2s$ , witch means a non-noise components (not to exhibit the spike noise). Wilensky et al. is using also the formula (6):  $\text{blend} = \sqrt{(1-\beta)} * I1n + \sqrt{\beta} * I2n$  (column 7, line 50), with the second weighting factor  $\sqrt{\beta}$  varying between (0) to (1) (column 8, line 5), and ( $I1n$  and  $I2n$  means a -noise components) on discrete picture elements (paragraph [0001], line 2), (the discrete picture element is read as a pixel) determined to exhibit spike noise (the exhibit is read as display or show), (if  $\beta = 0$ ,  $\text{Blend} = I1n + I2n$  witch means there is a noise component (to exhibit the spike noise).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the system of Wilensky et al., where blending the first and second image components, in the system of Fritz et al. because such feature result in a faster transition in the high-frequency components and thereby reduce the size of any region affected by noise cancellation while still allowing a gradual overall transition (column 1, line 64-67).

10. Claims 2 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fritz et al., Tannenbaum et al. and Wilensky et al., as applied to claim 1 above, and further in view of Yu et al. (US 6,563,513).

**(1) Regarding claim 2:**

Fritz et al., Tannenbaum et al. and Wilensky et al. disclose all the subject matter as described in claim 1 above.

Fritz et al., Tannenbaum et al. and Wilensky et al. do not explicitly mention the rank-order filtering of the input image data.

Yu et al., in analogous environment, teaches an image processing method and apparatus for generating low resolution, low bit depth images, where filtering the image valley with the rank order filter (column 3, line 4-7), (the filtering of the image valley with the rank order filter is read as the same concept as the filtering of the input image with the rank order filter).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the system of Yu et al., where filtering the image valley with

the rank order filter, in the system of Fritz et al. in order enable efficient compression and transmission of images to mobile devices having low resolution displays (column 1, line 60-62).

**(2) Regarding claim 5:**

Fritz et al., Tannenbaum et al. and Wilensky et al. disclose all the subject matter as described in claim 2 above. (The blending of the rank order filtered input image data with the processed image data is read as the same concept as the blending of data derived from the input image data with the processed image data based)

Fritz et al., Tannenbaum et al. and Wilensky et al. do not explicitly mention the rank order filtering of the input image data.

Yu et al., in analogous environment, teaches an image processing method and apparatus for generating low resolution, low bit depth images, where filtering the image valley with the rank order filter (column 3, line 4-7), (the filtering of the image valley with the rank order filter is read as the same concept as the filtering of the input image with the rank order filter).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the system of Yu et al., where filtering the image valley with the rank order filter, in the system of Fritz et al. in order enable efficient compression and transmission of images to mobile devices having low resolution displays (column 1, line 60-62).



11. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fritz et al., Tannenbaum et al. and Wilensky et al., and Yu et al., as applied to claim 2 above, and further in view of Nishikawa et al. (US 5,673,332).

Fritz et al., Tannenbaum et al. and Wilensky et al., and Yu et al. disclose all the subject matter as described in claim 2 above.

Fritz et al., Tannenbaum et al. and Wilensky et al., and Yu et al. do not explicitly mention the computing of an absolute difference between the rank-order filtered input image data and the input image data.

Nishikawa et al., in analogous environment, teaches a computer-aided method for image feature analysis, where computing the absolute difference produced by the combining of the results of erosion and dilatation operation (column 21, line 42-43), (the absolute difference produced by the combining of the results of erosion and dilatation operation is read as the same concept as the computing of an absolute difference between the rank-order filtered input image data and the input image data).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the system of Nishikawa et al., where computing of an absolute difference, in the system of Fritz et al. in order to provide an automated method and system for providing reliable early diagnosis of abnormal anatomic regions (column 3, line 38-40).

12. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fritz et al., Tannenbaum et al., Wilensky et al., Yu et al., and Nishikawa et al., as applied to claim 3 above, and further in view of Avinash (US-PGPUB 2003/0099405).

Fritz et al., Tannenbaum et al., Wilensky et al., Yu et al., disclose all the subject matter as described in claim 3 above.

Fritz et al., Tannenbaum et al., Wilensky et al., Yu et al., do not explicitly mention the generating of multilevel mask of spike noise likelihood based upon the absolute difference.

Avinash, in analogous environment, teaches CT dose reduction filter with a computationally efficient implementation, where applying a threshold criteria to identify structures. The structures identified are used to generate a structure mask (paragraph [0038], line 4-8), (the generating of structure mask is read as the same concept as the generating of multilevel mask of spike noise likelihood).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the system of Avinash, where forming a threshold mask image, in the system of Fritz et al. because such feature would be robust in its implementation and would address not only the general image processing problems but also those specific to CT imaging (paragraph [0011], line 1-6).

13. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fritz et al., Tannenbaum et al. and Wilensky et al., as applied to claim 1 above, and further in view of Avinash (US-PGPUB 2003/0099405).

Fritz et al., Tannenbaum et al. and Wilensky et al. disclose all the subject matter as described in claim 1 above.

Fritz et al., Tannenbaum et al. and Wilensky et al. do not explicitly mention the shrinking of the input image by a desired factor and interpolating the resulting image to the size of the input image.

Avinash, in analogous environment, teaches CT dose reduction filter with a computationally efficient implementation, where shrinking the input image by a desired factor (paragraph [0048], line 3-7) and interpolating the resulting image to the size of the input image (paragraph [0089], line 1-6).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the system of Avinash, where shrinking of the input image by a desired factor, in the system of Fritz et al. because such feature would be robust in its implementation and would address not only the general image processing problems but also those specific to CT imaging (paragraph [0011], line 1-6).

14. Claims 8, 22, and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fritz et al. (US-PGPUB 2003/0199762) in view of Tannenbaum et al. (US 6,535,623), Wilensky et al. (US 7,171,057), Yu et al. (US 6,563,513), Nishikawa et al. (US 5,672,332), Avinash et al. (US-PGPUB 2003/0099405).

**(1) Regarding claims 8, 22, and 25:**

Every element of claims 8, 22, and 25 have been addressed with respect to claims 1 to 5.

Furthermore, Frits et al. teaches a method, apparatus (paragraph [0003], line 1) and computer program (paragraph [0037], line 1-2) regarding the system of claim 22 and the computer program of claim 25.

**(2) Regarding claim 10:**

Fritz et al., Tannenbaum et al., Wilensky et al., Yu et al., and Nishikawa et al. disclose all the subject matter as described in claim 8 above.

Fritz et al., Tannenbaum et al., Wilensky et al., Yu et al., and Nishikawa et al. do not explicitly mention the structural regions defined by the input image data.

Avinash et al. (US-PGPUB 2003/0099405), in analogous environment, teaches a CT dose reduction filter with a computationally efficient implementation, where the exemplary image includes structural regions (paragraph [0045], line 1-3).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the system of Avinash et al., where exemplary image includes structural regions, in the system of Tannenbaum et al. because such feature would be robust in its implementation and would address not only the general image processing problems but also those specific to CT imaging (paragraph [0011], line 1-6).

15. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fritz et al., Tannenbaum et al., Yu et al., Wilensky et al., Nishikawa et al., Avinash et al., as applied to claim 8 above, and further in view of Nakabayashi et al. (US 7,113,306).

Tannenbaum et al., Fritz et al., Yu et al., Nishikawa et al., Avinash et al., Wilensky et al. disclose all the subject matter as described in claim 8 above.

(the multi-level mask was disclosed before by Avinash et al. (step 116, Fig.5, column 7, line 15-17),

Tannenbaum et al., Fritz et al., Yu et al., Nishikawa et al., Avinash et al., Wilensky et al. do not explicitly mention the encoding of weighting factors for blending the data corresponding the discrete picture elements.

Nakabayashi et al., in analogous environment, teaches an image data processing apparatus and image data processing method, where the mask sets a central value to the weighting of a pixel to be processed in the image data (column 22, line 46-48).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the system of Nakabayashi et al., where the weighting factors are set, in the system of Tannenbaum et al. in order to provide an image data processing apparatus capable of referring to a result obtained by easily carrying out an image processing while maintaining the originality of image data (column 1, line 48-51).

16. Claims 11, 16, 18-20, 23, and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tannenbaum et al. (US 6,535,623) in view of Hsieh (US 6,009,140) and Wilensky et al. (US 7,171,057).

**(1) Regarding claims 11, 23, and 26:**

Tannenbaum et al. disclose a method (column 8, line 66), system (column 1, line 9-10), and program (column 5, line 27-29) for processing of the input image data by identifying features of interest to produce processed image data (column 5, line 41-44).

Tannenbaum et al. do not explicitly mention the following items:

1) determining a likelihood that discrete picture elements in the input image data exhibit spike noise; and

2) blending data derived from the input image data with the processed image data via weighting factors determined based upon the likelihood that the discrete picture elements exhibit spike noise.

**(A) Concerning item 1):**

Hsieh, in analogous environment, teaches a stair-case suppression for computes tomography imaging, where the probability that the spike noise will be erroneously considered as high-density objects is determined within the boundary (column 2, line 15-17), (the likelihood is read as probability, and the discrete picture is read as CT imaging).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the system of Hsieh, where determining the probability to reduce the spike noise in the input image data, in the system of Tannenbaum et al. in order to enable reducing the motion effect within each tomographic slice without increasing the discontinuity between slices (column 1, line 58-63).

**(B) Concerning item 2):**

Wilensky et al., in analogous environment, teaches where the first and second image components are blended together to produce a blended component (Fig. 1, step 110, column 4, line 63-66), (the blending of the image first and second image components is read as the same concept as the blending of the data derived from the input image data with the processed image data) via weighting factors (column 6, line 17-20). (the likelihood that the discrete picture elements exhibit spike noise was described by Hseish (column 2, line 15-17).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the system of Wilensky et al., where blending the first and second image components, in the system of Fritz et al. because such feature result in a faster transition in the high-frequency components and thereby reduce the size of any region affected by noise cancellation while still allowing a gradual overall transition (column 1, line 64-67).

**(2) Regarding claim 16:**

Tannenbaum et al. disclose all the subject matter as described in claim 11 above.

Tannenbaum et al. do not explicitly mention that weighting factor is performed on discrete picture elements determined not to exhibit spike noise, and blending via a least a second weighting factor is performed on discrete picture elements determined to exhibit spike noise.

Wilensky et al., in analogous environment, teaches an image blending using non-affine interpolation, where using the formulas (5):  $\text{blend} = (1-\beta) I1s + \beta I2s$  (column 7, line 49), with a first weighting factor  $\beta$  varying between (0) to (1) (column 8, line 5), and ( $I1s$  and  $I2s$  means a non-noise components) on discrete picture elements (paragraph [0001], line 2) (the discrete picture element is read as a pixel) determined not to exhibit spike noise (the exhibit is read as display or show), ( if  $\beta = 1$ ,  $\text{Blend} = I1s + I2s$ , witch means a non-noise components (not to exhibit the spike noise). Wilensky et al. is using also the formula (6):  $\text{blend} = \sqrt{(1-\beta) * I1n} + \sqrt{\beta * I2n}$  (column 7, line 50), with the second weighting factor  $\sqrt{\beta}$  varying between (0) to (1) (column 8, line 5), and ( $I1n$  and  $I2n$  means a -noise components) on discrete picture elements (paragraph [0001], line 2), (the discrete picture element is read as a pixel) determined to exhibit spike noise (the exhibit is read as display or show), (if  $\beta = 0$ ,  $\text{Blend} = I1n + I2n$  witch means there is a noise component (to exhibit the spike noise).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the system of Wilensky et al., where blending the first and second image components, in the system of Fritz et al. because such feature result in a faster transition in the high-frequency components and thereby reduce the size of any region affected by noise cancellation while still allowing a gradual overall transition (column 1, line 64-67).

**(3) Regarding claim 18:**

Tannenbaum et al. disclose a system for processing image data comprising:



a memory circuit for storing input image data (column 5, line 46-49);

a processing module for processing the input image data to generate image data (column 5, line 29-30).

Tannenbaum et al. do not explicitly mention the following items:

1) a spike noise blending module configured to determine a likelihood that discrete picture elements in the input image data exhibit spike noise;

2) and to blend data derived from the input image data with the processed image data via weighting factors determined based upon the likelihood that discrete picture exhibit spike noise.

**(A) Concerning item 1):**

Hsieh, in analogous environment, teaches a stair-case suppression for computes tomography imaging, where the probability that the spike noise will be erroneously considered as high-density objects is determined within the boundary (column 2, line 15-17), (the likelihood is read as probability, and the discrete picture is read as CT imaging).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the system of Hsieh, where determining the probability to reduce the spike noise in the input image data, in the system of Tannenbaum et al. in order to enable reducing the motion effect within each tomographic slice without increasing the discontinuity between slices (column 1, line 58-63).

**(B) Concerning item 2):**

Wilensky et al., in analogous environment, teaches a system where the first and second image components are blended together to produce a blended component (Fig. 1, step 110, column 4, line 63-66), (the blending of the image first and second image components is read as the same concept as the blending of the data derived from the input image data with the processed image data) via weighting factors (column 6, line 17-20), (the likelihood that the discrete picture elements exhibit spike noise was described by Hseish (column 2, line 15-17).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the system of Wilensky et al., where blending the first and second image components, in the system of Fritz et al. because such feature result in a faster transition in the high-frequency components and thereby reduce the size of any region affected by noise cancellation while still allowing a gradual overall transition (column 1, line 64-67).

**(4) Regarding claim 19:**

Tannenbaum et al. disclose a system where the processing module is defined by computer code in an appropriately programmed computer system (column 5, line 29-30).

Tannenbaum et al. do not explicitly mention the blending module.

Wilensky et al., in analogous environment, teaches where the first and second image components are blended together to produce a blended component (Fig. 1, step

110, column 4, line 63-66), (it is read that producing of blended component has a blending module).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the system of Wilensky et al., where using a blending module, in the system of Fritz et al. because such feature result in a faster transition in the high-frequency components and thereby reduce the size of any region affected by noise cancellation while still allowing a gradual overall transition (column 1, line 64-67).

**(5) Regarding claim 20:**

Tannenbaum et al. further disclose a system, comprising an image acquisition system for generating the input image data (Fig. 8, step 132, column 12, line 64-67).

17. Claims 12 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tannenbaum et al., Hsieh and Wilensky et al., as applied to claim 11 above, and further in view further in view of Yu et al. (US 6,563,513).

**(1) Regarding claim 12:**

Tannenbaum et al., Hsieh and Wilensky et al. disclose all the subject matter as described in claim 11 above.

Tannenbaum et al., Hsieh and Wilensky et al. do not explicitly mention the rank-order filtering of the input image data.

Yu et al., in analogous environment, teaches an image processing method and apparatus for generating low resolution, low bit depth images, where filtering the image valley with the rank order filter (column 3, line 4-7), (the filtering of the image valley with

the rank order filter is read as the same concept as the filtering of the input image with the rank order filter).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the system of Yu et al., where filtering the image valley with the rank order filter, in the system of Fritz et al. in order enable efficient compression and transmission of images to mobile devices having low resolution displays (column 1, line 60-62).

**(2) Regarding claim 15:**

Tannenbaum et al., Hsieh and Wilensky et al. disclose all the subject matter as described in claim 12 above. (The blending of the rank order filtered input image data with the processed image data is read as the same concept as the blending of data derived from the input image data with the processed image data based)

Tannenbaum et al., Hsieh and Wilensky et al. do not explicitly mention the rank order filtering of the input image data.

Yu et al., in analogous environment, teaches an image processing method and apparatus for generating low resolution, low bit depth images, where filtering the image valley with the rank order filter (column 3, line 4-7), (the filtering of the image valley with the rank order filter is read as the same concept as the filtering of the input image with the rank order filter).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the system of Yu et al., where filtering the image valley with the rank order filter, in the system of Fritz et al. in order enable efficient compression

and transmission of images to mobile devices having low resolution displays (column 1, line 60-62).

18. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tannenbaum et al., Hsieh, Wilensky et al., and Yu et al., as applied to claim 12 above, and further in view of Nishikawa et al. (US 5,673,332).

Tannenbaum et al., Hsieh, Wilensky et al., and Yu et al. disclose all the subject matter as described in claim 12 above.

Tannenbaum et al., Hsieh, Wilensky et al., and Yu et al. do not explicitly mention the computing of an absolute difference between the rank-order filtered input image data and the input image data.

Nishikawa et al., in analogous environment, teaches a computer-aided method for image feature analysis, where computing the absolute difference produced by the combining of the results of erosion and dilatation operation (column 21, line 42-43), (the absolute difference produced by the combining of the results of erosion and dilatation operation is read as the same concept as the computing of an absolute difference between the rank-order filtered input image data and the input image data).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the system of Nishikawa et al., where computing of an absolute difference, in the system of Fritz et al. in order to provide an automated method and system for providing reliable early diagnosis of abnormal anatomic regions (column 3, line 38-40).

19. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tannenbaum et al., Hsieh, Wilensky et al., Yu et al., and Nishikawa et al., as applied to claim 13 above, and further in view of Avinash (US-PGPUB 2003/0099405).

Tannenbaum et al., Hsieh, Wilensky et al., Yu et al., and Nishikawa et al. disclose all the subject matter as described in claim 12 above.

Tannenbaum et al., Hsieh, Wilensky et al., Yu et al., and Nishikawa et al. do not explicitly mention the generating of multilevel mask of spike noise likelihood based upon the absolute difference.

Avinash, in analogous environment, teaches CT dose reduction filter with a computationally efficient implementation, where applying a threshold criteria to identify structures. The structures identified are used to generate a structure mask (paragraph [0038], line 4-8), (the generating of structure mask is read as the same concept as the generating of multilevel mask of spike noise likelihood).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the system of Avinash, where forming a threshold mask image, in the system of Fritz et al. because such feature would be robust in its implementation and would address not only the general image processing problems but also those specific to CT imaging (paragraph [0011], line 1-6).

20. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tannenbaum et al., Hsieh, and Wilensky et al., as applied to claim 11 above, and further in view of Avinash (US-PGPUB 2003/0099405).

Tannenbaum et al., Hsieh, and Wilensky et al. disclose all the subject matter as described in claim 11 above.

Tannenbaum et al., Hsieh, and Wilensky et al. do not explicitly mention the shrinking of the input image by a desired factor and interpolating the resulting image to the size of the input image.

Avinash, in analogous environment, teaches CT dose reduction filter with a computationally efficient implementation, where shrinking the input image by a desired factor (paragraph [0048], line 3-7) and interpolating the resulting image to the size of the input image (paragraph [0089], line 1-6).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the system of Avinash, where shrinking of the input image by a desired factor, in the system of Fritz et al. because such feature would be robust in its implementation and would address not only the general image processing problems but also those specific to CT imaging (paragraph [0011], line 1-6).

**Contact Information:**

21. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Amara Abdi whose telephone number is (571) 270-1670. The examiner can normally be reached on Monday through Friday 7:30 Am to 5:00 PM E.T..

Application/Control Number:  
10/723,736  
Art Unit: 2624

Page 23

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wu Jingge can be reached on (571) 272-7429. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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11/21/2007.

  
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